

acquisition with the position acquisition unit 5, the tip 21 of the instrument 20 can be mixed into the 3D ultrasound image dataset 17 generated with the ultrasound laparoscope 22, or into a 3D image cube 18, as in the case of the previously described exemplary embodiment. The mixing of the image of the tip 21 of the instrument 20 into the 3D ultrasound image dataset 17 is schematically shown with a cross 19 in Figure 2.

Figure 3 illustrates the navigation with 2D imaging in real time on the basis of ultrasound images acquired in real time. The arrangement shown in Figure 3 essentially corresponds to the arrangement of the inventive system shown in Figure 1, so that the components shown in Figure 3 that are identical to components of the exemplary embodiment shown in Figure 1 are provided with the same reference characters.

In a known way, a sector 30 can be scanned with the ultrasound head 2 applied to the body surface of the patient P, this being displayable on a viewing means of the navigation computer 7 as sector scan 31. The attitude and orientation of the sector scan 31 is known due to the position acquisition with the position acquisition unit 5 and due to the known relationship between the acquired 2D ultrasound data and the transmission and reception surfaces of the ultrasound head 2 in the reference coordinate system K1. With the assistance of the position sensor 13, the position of the instrument 14 can be simultaneously determined in the reference coordinate system K1 with the position acquisition unit 5 and, accordingly, the image of the instrument 14 can be correspondingly mixed into the sector scan 31 visualized in the navigation computer 7 and displayable on a viewing means. In the present exemplary embodiment, the position of the tip of the instrument 14 is mixed into the sector scan 31 in the form of a cross 32.

As a result of the acquisition of the images in real time, the visualization of the instrument 14 in the sector scan 31 could also be achieved without acquiring the position of the instrument 14 if the instrument 14 were always situated in the image plane of the sector 30. This, however, usually cannot be expected due to the manual positioning of the ultrasound head 2. Due to the position acquisition of the position sensor 3 arranged at the ultrasound head as well as of the position sensor 13 arranged at the instrument, however, the attitude of the instrument 14 relative to the sector 30 is known, so that the